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Testing a light Higgs of 95 GeV at CEPC

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Several excesses around 95 GeV hint at an additional light scalar beyond the Standard Model. We examine the CEPC's capability to test this hypothesis via the Higgsstrahlung channel $e^+e^- \to ZS$ ($Z \to \mu^+\mu^-$, $S \to \tau^+\tau^-/b\bar{b}$). Our results show that a 210 GeV CEPC run with deep neural networks robustly probes the 95 GeV excess, covering large model parameter spaces. We also discuss future hadron colliders (HL-LHC, HE-LHC, FCC-hh, SppC) for contrast, and use representative models (MDM, Type-I 2HDM, flipped N2HDM, NMSSM) to illustrate these colliders' reach.

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